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CONNECTING the MEKONG THROUGH EDUCATION and TRAINING USAID COMET

REGIONAL BASELINE STEM+AT LABOR MARKET ASSESSMENT 2015




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UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT CONNECTING THE MEKONG THROUGH EDUCATION AND TRAINING (USAID COMET) PROJECT

Regional Baseline STEM+AT Labor Market Assessment Report

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EXECUTIVE SUMMARY

Improving the skills of young workers is imperative for lasting and transformative change in the Lower Mekong (LM) sub-region. To this end, USAID's Connecting the Mekong through Education and Training (USAID COMET) project is helping universities and vocational centers to increase the number of skilled workers in science, technology, engineering, mathematics, accounting, and tourism (STEM+AT) fields in the Lower Mekong countries (Cambodia, Lao PDR, Myanmar, Thailand, and Vietnam). USAID COMET is bringing together public and private sector partners and using information technology to deliver accessible training in key sectors.

The Regional Baseline STEM+AT Labor Market Assessment (Baseline Assessment) is the foundational tool that USAID COMET will use to survey primary and secondary sources in the Lower Mekong region annually in order to identify and detail:

- Priority economic sectors, labor market trends, jobs, and occupations that incorporate STEM+AT and that will be most relevant for the instructors and learners/job-seekers; and

- Specific skill sets, whether technical "hard" or cross-cutting "soft" skills that need strengthening for new workforce entrants in STEM+AT.

For the Baseline Assessment, USAID COMET conducted 90 employer surveys, 60 in-depth interviews with employers, 46 key informant interviews (educational institutions, government and trade associations), and 16 student focus group discussions across the five LM countries.

Several core themes inform key workforce development trends in the Lower Mekong sub-region and that will guide the project, including:

1. Rapid Growth Transforming Leading Industries and Sectors

Opportunities abound for skilled job seekers. The most common industries of surveyed employers were tourism, food processing and automotive, accounting for 60% of respondents. The vast majority of respondents indicated they perceived growing demand within their industries, with **nearly 80% of respondents indicated that they are currently looking to hire new staff, most commonly in order to expand the scope of their businesses.**

2. A set of regional key industries "stood out" as candidates for USAID COMET

The results of the 2015 Baseline Assessment identified five regional key industries clusters with links to STEM+AT skills that will be the main focus of skill development for this project: **agriculture**/aquaculture, agro-processing, food and beverage processing; **automotive** parts manufacturing/vehicle assembly; **construction**; **electronics** (low and high value add); and **tourism**. Figure 1 illustrates regional growth sector proportionate to the prevalence of each industry across the five studied countries.

Throughout the life of project, USAID COMET will continue to update information regarding country-specific industries, with an eye to emerging growth sectors to ensure that curriculum content, trainings, and other activities reflect needs driven by business demands.

Figure 1. Regional Growth Sectors

Table 1 lays out the key and emerging growth sectors by country, based on data from World Bank East Asia and Pacific Economic Update, April and October Issues (2013-2014):

Table 1. Key Growth Sectors, by Country

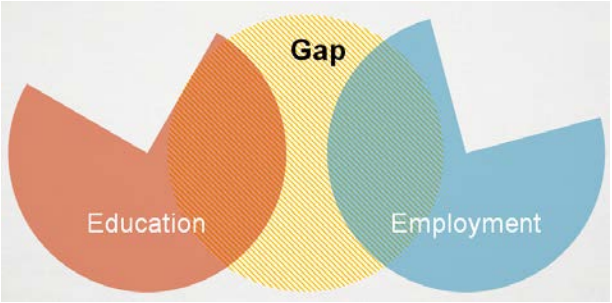
Country	Key growth sector	Emerging growth sector
Cambodia	• Garment • Construction • Agriculture • Tourism	• Electronics and vehicle parts
Lao PDR	• Natural resources sector (mining, hydropower, wood) • Construction • Tourism • Agriculture	• Garment • Telecommunications
Myanmar	• Natural resources (gas) • Construction • Tourism • Agriculture	• Energy • Garment • Telecommunications • Food and beverages

Country	Key growth sector	Emerging growth sector
Thailand	• Electronics (high value add) • Food processing and agro-products • Automotive Manufacturing • Metal and steel • Tourism	• Automotive: manufacturing factory floor and production line • Food processing: logistics systems
Vietnam	• Electronics (high value add) and automotive parts • Garments, footwear, and furniture, • Agriculture (commodity exports) and aquaculture • Construction • Tourism	• Information and Technology • Biotechnology • Environmental protection • Marketing and business

3. The representation of female workers varies by industry

The project will be mindful of gender gaps and ways to improve female participation in the labor force, particularly in high demand industries and where female participation is lower and could feasibly be increased. Findings from the companies surveyed indicate that there were fewer female employees than male full-time and part-time employees. Industries with low female participation included: automotive, chemical, construction, agriculture, tourism, with agriculture and construction having the lowest female participation. Industries with near equal participation included: electronics and food processing. Industries with the highest female participation included garment and health care.

4. Businesses are interested in internships or other work-based learning programs to address the mismatch between the skills new workforce entrants typically have and the skills that employers need.



USAID COMET will leverage the keen interest expressed by employers in establishing stronger linkages to education and training institutions. Across the LM sub-region, surveyed employers expressed considerable interest in developing closer ties to training institutions through on-the-job training or internship programs. Among companies not implementing an internship program, the most commonly cited reason was a concern that interns would take too much staff time to properly train, and therefore that interns would act as a hindrance rather than to boost productivity.

5. Skill gaps vary by industry, but reflected common themes

The project is mindful of the need to effectively prepare job seekers, including those jobseekers with a lack of relevant work experience and practical skills. Employers frequently reported that recent graduates were unprepared, in terms of technical, non-technical, and non-cognitive skills. **As a result, employers largely felt recent graduates were unable to perform well on the job or that they required**

additional training. Many of the surveyed companies provided training to new employees, and estimated that new employees take between three months and two years to learn the skills necessary to perform their jobs.

Employers frequently identified **computer and English as non-technical skills that their employees need to improve.** Basic computer skills and English are considered important and mandatory for skilled labor (at both technician and manager levels) in order for employees to perform their daily tasks properly. However, many students are not well trained on these skills before entering the job market.

In terms of **non-cognitive skills, diligence, teamwork, adaptability, communication, and time management were the most commonly cited as critical and lacking skills in new workforce entrants.** In Cambodia, employers frequently reported a lack of **foundational skills, such as literacy or numeracy**, in new hires. This lack of foundational skills creates a barrier to further skills upgrading or training, as these employees typically find it difficult to *learn how to learn*. Based on these findings, USAID COMET views foundational, technical, and cross-cutting skills as interdependent, together creating the core set of skills needed for key growth industries to maintain a skilled and successful workforce. Foundational skills include literacy, numeracy, and English/foreign language skills. Technical skills refer to the diversity of skills in high-demand STEM+AT fields, ranging from automotive technician to nursing to computer programming. Cross-cutting skills include work-readiness, entrepreneurship, and managerial skills.

6. Telecommunications access varies greatly by country

Internet access varies widely across the region, with youth most commonly using mobile devices to connect to the Internet. However, **literacy with computers – including understanding standard office suites – is considered a basic, entry level skill by many employers**. Where feasible, USAID COMET will address the differential access to the Internet through such means as using low bandwidth technologies and the use of mobile technologies.

USAID COMET will focus on interventions that address the following key assessment findings:

- Dynamic and rapid integration of the LM countries, requiring job seekers to have a mix of foundational, technical and work readiness skills

- Employers are hiring across the region, but they want employees with foundational technical, and work readiness skills
- Marked lack of practical and applied skills and experience, but high demand from businesses for on-the-job training or internship programs.
- The regional key growth sectors that will be the focus of USAID COMET in Year 1 include:
    - Agriculture/Aquaculture, Agro-processing, Food and Beverage Processing;
    - Automotive Parts Manufacturing/Vehicle Assembly;
    - Construction;
    - Electronics (low and high value add); and
    - Tourism

The result, it is hoped, is a profound positive increase in the lives of youth across the Lower Mekong and a valuable contribution to prosperity and peace for the long-term.

Contents

INTRODUCTION

A 2003 paper developed by the Mekong River Commission, *A Social Atlas of the Lower Mekong Region*[1], paints a picture of a youthful, dynamic region, with 80% of the population living in rural areas and dependent on subsistence agriculture or natural resources as a livelihood. The report also describes an unsettled population, with migration patterns that had been driven by urban opportunity in the early 1990s still in reversal in the wake of the 1997 financial crisis. Countering the trend of migrants returning home to rural areas, and foreshadowing economic transformation over the upcoming decade, the commission report noted that, "increasing numbers of women are migrating to cities to work in low-skill manufacturing and service sector jobs[2]".

An updated report, commissioned in 2010, provides a snapshot of a region in vibrant transition, with economic cooperation driving transformation in cross-border infrastructure and energy development, and fueling rapid albeit uneven economic growth. Between 2003 and 2013, Thailand's GDP more than doubled and Vietnam's has nearly tripled. Today, Thailand is an upper middle income country, with per capita GDP of $9,900[3], and Vietnam has graduated to lower middle income status with a per capita GDP of $4,000[4]. Smaller and slower change has affected the remainder of the region: Lao PDR is now a lower middle income country with per capita GDP of $3,100[5], while Myanmar and Cambodia are low income countries, with per capita GDP of $1,700 and $2,600, respectively[6].

Against this backdrop, the USAID COMET project was launched at the end of 2014, with the ultimate objective of improving economic integration and global competitiveness through human resource development in the Lower Mekong sub-region. By bringing technology and online resources to vocational and higher education institutions and learners, USAID COMET will help to increase the number of skilled workers in science, technology, engineering, mathematics, accounting, and tourism (STEM+AT) fields in the Lower Mekong (LM) countries (Cambodia, Lao PDR, Myanmar, Thailand, and Vietnam). USAID COMET will bring together public and private sector partners and use information technology to deliver accessible training in key sectors.

As a first and fundamental step towards achieving its objectives, USAID COMET has carried out a regional baseline STEM+AT Labor Market Assessment (Baseline Assessment) across the five LM countries to identify and detail priority economic sectors, labor market trends, as well as specific skill sets, whether technical "hard" or "soft" skills that need strengthening for new workforce entrants in STEM+AT. The Baseline Assessment has also sought to identify the range of access to telecommunication and Internet throughout the Lower Mekong sub-region. The Assessment used qualitative and quantitative primary data collection methods, as well as a desk review of secondary data.

METHODOLOGY

The Regional Baseline STEM+AT Labor Market Assessment (Baseline Assessment) is the foundational tool that USAID COMET is using to survey primary and secondary sources in the LM sub-region annually in order to identify and detail:

- Priority economic sectors, labor market trends, jobs, and occupations that incorporate STEM+AT and that will be most relevant for the instructors and learners/job-seekers; and
- Specific skill sets, whether technical "hard" or "soft" skills that need strengthening for new workforce entrants in STEM+AT.

USAID COMET implemented the Baseline Assessment in December 2014 / January 2015 using mixed methods.

Desk Review. For the desk research, the USAID COMET team reviewed academic papers, documents from multilateral or bilateral organizations active in the LM sub-region, project reports by local and international Non-Governmental Organizations (NGOs), as well as data and policy documents published by host country governments. These documents were reviewed for information pertaining to regional and country-specific key STEM+AT sectors, growth projections for sectors, labor market trends such as employment, labor market participation, and regional labor migration patterns. Particular attention was paid to notices of a mismatch between the demand and supply of specific, STEM+AT-relevant labor market skills as well as information regarding "foundational" skill preparedness such as literacy. Demographic information including population distributions changes in poverty rates, changes in GDP, and changes in countries' sector mixes were also noted.

Primary Data Collection. Primary data collection targeted five countries: 1) **survey** of a sample of STEM+AT employers; 2) **key informant interviews** with employers, schools, and officials within ministries of labor and education, and 3) **focus groups** with STEM+AT students. Employer survey data were collected as telephone interviews in local language and encoded in data collection software in English. Qualitative data from key informants was collected through face-to-face and phone interviews. Additionally, focus group discussions with students from STEM+AT majors were conducted in a sample of training institutions in five countries.

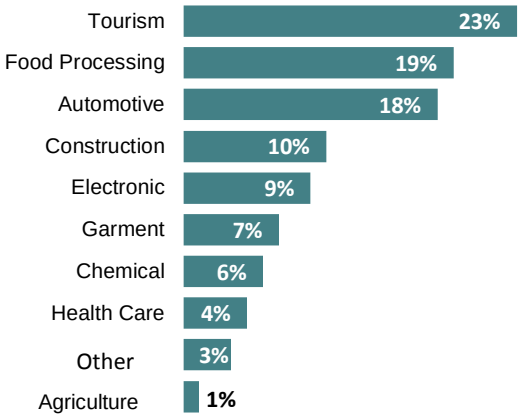
Key growth sectors were determined by a combination of desk research and input from USAID COMET data collectors.

Table 1. Data Collection Methods and Sample

Method of Primary Data Collection	Planned Sample Size	Achieved Sample Size
Employer Survey	60 surveys (12 in each country)	90 surveys
Employer In-Depth Interview	60 interviews (12 in each country)	60 interviews
Key Informant Interview (educational institutions, government or trade association)	45 interviews (9 in each country)	46 interviews
Students Focus Group Discussion	15 focus groups (3 in each country)	16 focus groups

The majority (84.4%) of the companies surveyed were located or had offices in only one country. Employers participating in the survey primarily came from the tourism, food processing and automotive industries accounting for 60% of respondents. Representation by industry varied country by country. More than half of the surveyed employers were small and medium sized with a range of 11 to 250 full-time and part-time employed staff. The remaining companies in the survey were large, with the number of employees ranging from more than 250 to 20,000 full-time and part-time staff. Only three employers that participated in the survey were micro-sized, employing 10 or fewer staff.

Figure 2. Distribution of Surveyed Companies by Industry



According to survey responses and based upon the number of employees, the electronic industry was the largest in Cambodia, followed closely by the tourism industry. In Lao PDR the largest industry was the garment industry, followed by electronics. Similarly, in Myanmar, the garment industry was the largest. In Thailand, the automotive industry was the largest followed by food processing and health care industries. In Vietnam, the chemical industry was the largest, followed by the health care and garment industries.

In terms of the currently employed technical staff from the surveyed companies, on average across the region, the health care sector, chemical sector and tourism sectors had the largest proportion of technical staff out of total employees, with technical staff comprising over half of all employees. In Cambodia, companies in the automotive industry had the largest percentage of technical staff; with technical staff comprising more than a third of currently employed staff. In Lao PDR, although the garment industry was the largest in terms of number of employees, the construction/ property development industry had the most technical staff, followed by the tourism sector. In Myanmar, it was the electronic and tourism industries, while in Thailand the tourism and health care industries had the largest percentage of current staff that were technical staff. Employers in Vietnam indicated that the majority of employees were technical staff with the exception of the garment sector.

Appendix B includes a detailed description of methods and data collection tools, and includes a summary of assessment data sources.

KEY FINDINGS

1. Regional Integration of the Lower Mekong

The Baseline Assessment has identified the following inter-related key findings:

- The Lower Mekong sub-region is undergoing rapid labor and economic integration and transition
- In order to keep pace, businesses are placing high demand on technical, work readiness and foundational skills in STEM+AT fields

The project's focus on skill development and improving the linkages between current and future employees with employers and education and training institutions will need to take into account and leverage the rapid regional integration of economies and the labor force across the LM countries. In order to be competitive, job seekers are to develop skills that enable them to succeed in an environment that demands a strong mix of technical, work readiness and foundational skills. One promise of the ASEAN Economic Community (AEC), scheduled to launch in 2015, is that developing a regional production base, by linking industry clusters across Lower Mekong countries, will ratchet skills and productivity upwards. For example, linking Vietnamese or Cambodian automotive parts manufacturers and suppliers to Thai automotive engineering and assembly plants may drive growth by reducing costs[7] but also may promote skill upgrading as companies may find they can build regional professional development, internship, or other training programs. This specialization is particularly relevant since the AEC will promote the free flow of skilled labor across the ten ASEAN member states, and therefore encourage countries to carve out niches where industry policy delivers a comparative advantage. This shift is likely to generate positive disruption in the regional labor markets as workers seek opportunities and wages that match their skills. This process is already emerging in the region as local industry clusters have become integrated into global value chains.

A significant driver of growth—both currently and in anticipation of the AEC—is the extent and openness of regional labor migration. Increasing the size of available labor serves as a wind-at-the back of well-planned policy, increasing impact so long as the labor market is able to absorb new workforce entrants. Limits on labor market absorption in Cambodia, Lao PDR, and Myanmar have pushed low- and semi-skilled labor into Thailand; frequently these migrants support rural and poor families back home. In 2013, remittances from migrant workers contributed 1.8% to Cambodia's GDP, 1.3% to Lao PDR's GDP, and 1.1% to Myanmar's GDP[8]. In the Lower Mekong, these remittances have been found to drive local growth, both through increasing income for families and through building skills of migrant workers. Indeed, recent reports on migrant workers suggest that many are able to transfer to entrepreneurial activities once they return home[9].

TRANSFORMATION OF THE LOWER MEKONG SUB-REGION – A SNAPSHOT

The Lower Mekong is a sub-region in transition, showcasing dramatic gains in income and growth over the last 15 years. These changes have been driven by a number of factors including growth in infrastructure and energy, broad shifts to higher-skilled manufacturing, and the emergence of high-skilled service work throughout the region. These trends, in turn, have significantly reduced poverty throughout the region.

By 2015, **Lao PDR** is expected to achieve the Millennium Development Goal of halving its poverty, with a current overall poverty rate of 27.6%. **Myanmar** is on track to achieve a reduction in its poverty rate to 16% by 2016, with the reduction driven by reform-related strong economic performance and donations from the development community. **Thailand** and **Vietnam** have dramatically reduced poverty: Thailand's poverty rate in 2000, of 42.6% of the population, was reduced to 12.6% by 2012, and Vietnam drove its poverty rate down from a high of 58% in 1993 to an estimated 11.3% in 2011. **Cambodia** has made improvements as well, although at a slower pace than the rest of the region. In 2009, the World Food Programme noted that 15 – 20% of the Cambodian population was living in extreme poverty and 33% of the population as undernourished. Today, Cambodia remains one of the poorest in the Lower Mekong, with 50% of the population living in poverty; the World Food Program estimates that 40% of Cambodian children are malnourished. The overall positive regional trends also mask pockets of deep poverty, particularly in cases where migrant workers are not counted among the formal workforce.

Sources: WHO 2009 as cited in the MRC 2010 State of the Basin, p. 44, UNDP Country Pages Lao PDR, Myanmar, Thailand Vietnam; WFP 2009 as cited in the MRC 2010 State of the Basin, p. 42; BTL 2014; U.S. State Department (2014)

Since 2003, Thailand and Vietnam have shifted their sector mixes to higher-value added agriculture, manufacturing and assembly, and then upgraded skills across sectors and developed industry clusters to achieve the current high-value added manufacturing and services sectors that are thriving—and drawing labor migration—today. Regionally, Thailand serves as the manufacturing powerhouse and hub of most industry in the LM sub-region. In comparison to neighboring countries, Thailand's labor is better skilled, and the country is increasingly transitioning to higher value added industries. In part due to this transition, there is a shortage of skilled labor as vocations and trades are drawing less interest than university degree programs. An EDC Assessment of Thailand found a pattern of consistently decreasing enrollment in vocational skill training each year starting in 2009.[10]

Vietnam's sectors have largely attracted low wage but skilled labor, but the country may be close to exhausting[11] its supply of low wage labor, both because its rural-to-urban migration rate is slowing and because of the decreasing size of its youth cohort. In contrast, Myanmar, Cambodia, and Lao PDR are still heavily dependent on low-skilled, primarily agricultural labor. In order to achieve the AEC vision of a regional production base in the Lower Mekong, each of these countries will need to upgrade their workforces at all skill levels. USAID COMET will be mindful of designing and carrying out activities that both raise the level of skills to suit more sophisticated types of industries while also ensuring that current

and future job seekers receive the level and type of skills and experiences that are well matched to opportunities in current economies and sectors.

DYNAMIC HIRING TRENDS AND STRATEGIES

HIRING TRENDS

80% of surveyed companies are currently looking into hiring new staff

A survey of employers conducted for this baseline assessment found that the health care, chemical and tourism industries had the largest percentage of employees that were technical staff, accounting for roughly half of all employees. The respondents from Cambodia's electronic industry hired the most technical staff last year, followed by Vietnam's health care industry, Cambodia's tourism industry, Thailand's food processing industry, and Thailand's automotive industry.

Opportunities abound for skilled job seekers. Although about half of the surveyed companies noted that they hired staff in technical positions last year, **nearly 80% of respondents indicated that they are currently looking to hire new staff.** The most commonly mentioned reason for hiring was for growth or expansion of business, followed by the need for worker replacement. About one third of the surveyed companies said that they hired managerial positions last year while only about a quarter mentioned that they were currently looking to hire managerial staff at the time of the survey.

Education is a critical factor in being hired. This is perhaps not surprising given the LM economies' rapidly increasing sophistication and dependence on information. Employers require a minimum of secondary school or vocational school diploma for their technical staff. However, **three out of five employers said that they require a bachelor's degree or above for a technical position**. As for managerial staff, the majority of employers (80%) said that they require bachelor's degree or above. Responses varied for administrative staff, with about half of employers requiring a bachelor's degree, while the other half required a vocational or secondary level diploma. In terrms of minimum experience required, technical positions largely rquired 1 to 3 years of experience, while mangerial and adminstrative positions often require 2 years of experience.

Technical Skills: Job specific abilities acquired through learning and practice

Non-Technical Skills: Cross-cutting skills necessary for workplace performance, such as competency with computers or English language proficiency

Non-Cognitive Skills: "Soft" skills such as diligence, teamwork, communications, leadership, or setting priorities

Figure 3. Required Education and Experience for Jobs in STEM+AT

When hiring, companies indicated that they typically rely on personal networks, employment agencies, company's website, local newspapers, and job boards (JobsDB, etc). The duration of hiring process varies from 1 day to 100 days to fill a position. The level of competitiveness varies by industry and company as employers indicated that they receive from 1 to 140 applications on average for one job posting; however on average, employers reported receiving 16 applications per posted job position. The **construction, garment and automotive industries reported the highest level of competitiveness** with employers reporting that they receive more applications for each advertised technical position compared to other industries.

2. STEM+AT Skill Mismatch

Skill development is typically regarded as "supply side" of the workforce, the responsibility of educational institutions, from primary through higher education to develop in response to the business "demand side." However, in the LM sub-region, as in many other parts of the world, mismatches between skills taught by educational institutions and skills sought by businesses can create pools of willing workers unable to find entry into formal markets because they don't have competencies that are needed at the workplace. In rapidly growing economies, such as those exemplified in the LM sub-region, timing becomes a critical issue as changing business demands in terms of needed skills may outpace the often sluggish response

TOP NON-COGNITIVE SKILLS

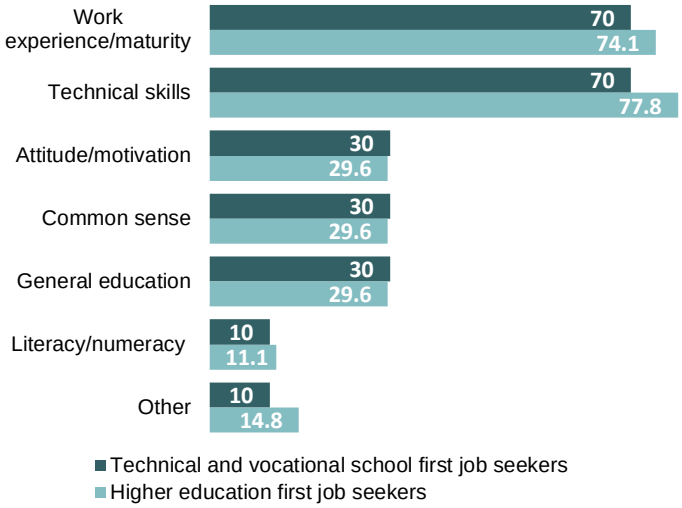
- Diligence
- Teamwork
- Adaptability
- Communication
- Time management

(Surveyed employers)

from the educational institutions. USAID COMET seeks to narrow the gap by connecting businesses with TVETs and higher education institutions in order to encourage private sector-informed changes in curricular and training programs.

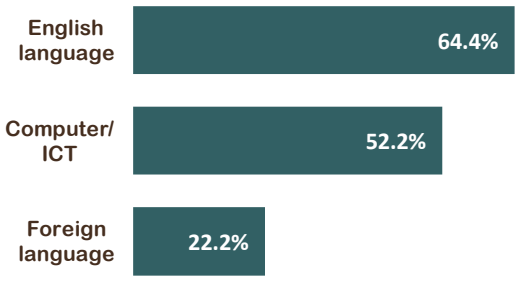
Cross-cutting skills, including work-readiness ("soft" skills), entrepreneurial skills, and managerial skills, are in high demand throughout the LM sub-region, regardless of industry area. Nearly all recent surveys in the region have demonstrated that for businesses, and especially those in export industries, or in high growth industries, the biggest drag on growth is in finding new hires and middle managers with these critical skills. In a 2013 regional survey conducted by the International Labor Organization, businesses most frequently cited "lack of working experience or maturity" as the most lacking competency among first-time job seekers[12].

Figure 4. Competencies Lacking among Job Seekers



In each of the five Lower Mekong countries, the skill gap differs due to differences in key sectors, but also differences in basic, or foundational, skills. In Cambodia, for example, 58.1% of students drop out of school before completing sixth grade[13]. This high primary drop-out rate has implications for STEM+AT skill development because often, most workers are lacking even in the most foundational skills of literacy and numeracy. Indeed, as Cambodia's 2014 diagnostic trade integration strategy paper indicates, many people graduate from primary, secondary, or even tertiary education with weak foundational skills, such as literacy and numeracy, communications, problem solving, and teamwork. Foundational skills are critical to life-long learning and future re-training in the work place[14]. In contrast, Thailand has a highly-skilled workforce, yet most Thais are not proficient in English[15], a language critical for regional integration as part of the AEC.

Figure 5. Percent of Employers Requiring Non-Technical Skills



Employers largely responded that **strong computer/ICT skills** and **English language skills** were important additional qualifications they looked for when hiring applicants for technical positions in their

company. Representatives of electronic, tourism, and automotive industries frequently cited English language proficiency as a needed skill lacking among new hires. Employers from the tourism, electronic, and garment industries stated that they would like to see applicants for technical positions who have computer and ICT skills. In contrast, employers from the tourism and food processing industries state they would like to see applicants with foreign language skills. **About three quarters of the companies surveyed said that they are more likely to hire a candidate for a technical or managerial position if they have strong computer and English language skills**. In addition, almost 90% of surveyed companies said that managerial positions require technical knowledge.

The survey asked employers to identify which non-cognitive skills they would look for when hiring new staff. Diligence, teamwork, adaptability, communication, and time management emerged as the top five non-cognitive skills valued by employers.

SKILL GAPS IDENTIFIED BY EMPLOYERS

The survey explored the areas where the skills of the current workforce could be improved. **Surveyed companies identified lack of language skills, teamwork, and technical skills as the three most significant skills gaps in their current workforce**. Companies also noted that lack of communication skills and lack of time management skills were also considerable issues. Eight out of ten respondents believed that training could help address some of these problems. Almost all companies that participated in the survey mentioned that they provide professional development/training for employees.

> "We feel that most of the lessons that are taught at schools are not relevant or match with the demand … lessons are more focused on theory rather than provide practice opportunities for students to learn from... As a result, when students start working, they do not know how to do work properly. This affects the quality of work performance."
>
> *(Wood Processing/ Agriculture Employer – Lao PDR)*

To better understand the STEM+AT skill gaps in the five LM countries USAID COMET is working in, USAID COMET conducted 60 in-depth interviews (IDIs) with employers in Cambodia, Lao PDR, Myanmar, Thailand and Vietnam. The sections below highlights the key findings related to skill gaps.

Technical Skill Gaps

Many employers expressed that recent graduates from universities and TVET schools often lack technical skills needed to succeed in the workplace. A common theme was that there was **often a mismatch in what recent graduates learned in school and what was needed on the job**. Employers explained that recent graduates largely learned theory in school, and as a result, lacked practical application and experience. **As a result of lack of practical experience, employers largely felt recent graduates were unable to perform well on the job or that they required additional training.** For example, an

employer in Vietnam explained that even for those students who received high grades in school, once on the job, they could fulfill only 50-70% of the job requirements. In Myanmar, employers said that about half of new hires needed additional training in order to meet basic job requirements. Several employers mentioned that school instructors were not equipped to teach students the technical skills they needed on the job. Additionally, there was insufficient coordination between industry and education institutions and some schools lack modern equipment for students to use in order to learn. For example, a Cambodian construction company reported that a challenge in hiring staff was finding candidates with skills in welding, plumbing, and mechanics; a Laotian garment manufacturer reported training new hires on technical skills such as sewing and tailoring; employers in Myanmar reported across-the-board weakness in technical skills. Employers in Thailand and Vietnam were much more likely to report weaknesses in non-technical and non-cognitive skills of new employees.

As a result of the reported technical skill gaps, employers largely reported needing to train and coach recent graduates to build their competencies to perform basic roles on the job. The duration of training and coaching varied by country, but ranged from three months to nine months; one company reported that new staff are not considered "skilled" until they have been on the job for two years. A representative from a Cambodian construction company said they spent at least three months coaching their newly recruited staff before they could start performing the work with minimal supervision. Similarly, a garment factory in Vietnam reported that they had to completely retrain new graduates given that what those students learnt in school was not relevant to the actual job.

Non-technical Skill Gaps

Employers also identified **computer and English as non-technical skills that their employees need to improve.** Basic computer skills and English are considered important and mandatory for skilled labor (at both technician and manager levels) in order for them to perform their daily tasks properly, but many students were not well trained on these skills before they came to the job market. In Lao PDR, one employer noted that students learn English through textbooks and they could not communicate effectively with foreigners.

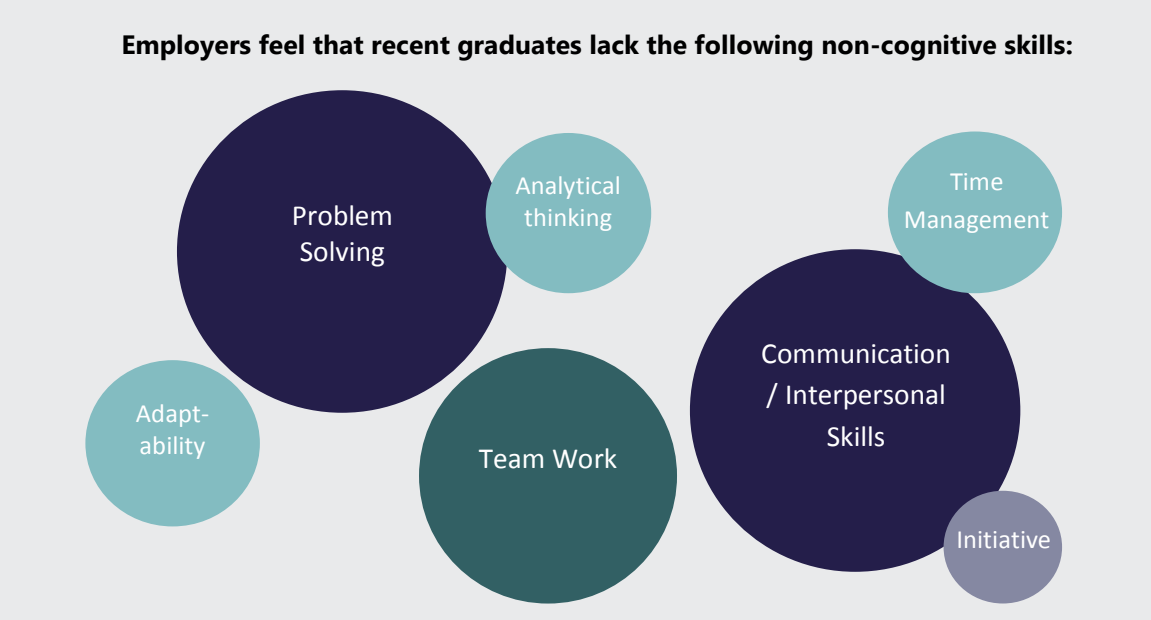
> "Apart from technical knowledge and skills, the company also requires for other knowledge and skills such as ICT, English and non-cognitive skills which help them to adapt quickly in the work. However, these knowledge and skills are not fully equipped for students during their training time in school."
>
> *(Accounting Employer – Vietnam)*

Non-Cognitive Skill Gaps

Nearly half of the surveyed employers also expressed that recent graduates lacked non-cognitive skills that are necessary for success in the workplace. **For non-cognitive skills, diligence, teamwork, adaptability, communication, and time management are the top common five most important skills** that employers in the LM sub-region want to see their staff improved. In all countries in the Lower

Mekong, employers participating in the survey felt that schools had not focused enough on training students on non-cognitive skills.

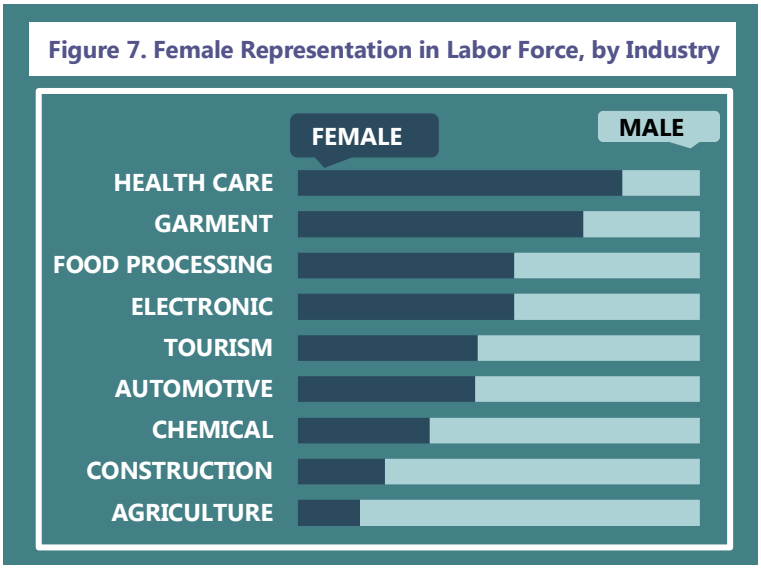
Figure 6. Non-Cognitive Skills in Demand by STEM+AT Employers



DIVERSE RANGE OF FEMALE REPRESENTATION

Although over more than half of the surveyed companies noted that they did not have gender preference for their technical positions, **findings from the companies surveyed indicate that there were fewer female employees than male full-time and part-time employees**. In several industries surveyed, female representation was low at the technical and managerial levels. At the country level, the number of female staff was also lower than males from companies surveyed in Cambodia, Myanmar, and Thailand. From the companies surveyed in Lao PDR, there were more female employees than male. In Vietnam, the number of both male and female staff was almost similar. By industry, there were more female than male workers in

Figure 7. Female Representation in Labor Force, by Industry



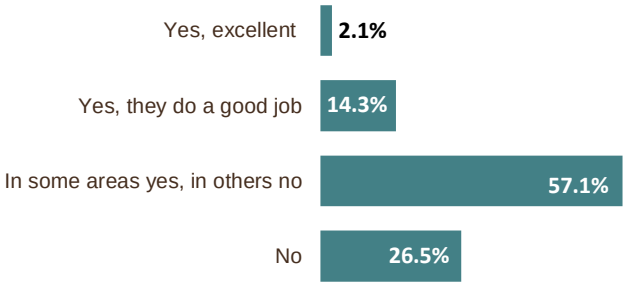
the electronic, food processing, health care, and garment industries. There were more male than female workers in the automotive, tourism, construction, and chemical industries.

- **Industries with low female participation**: automotive, chemical, construction, agriculture, tourism, with agriculture and construction having the lowest female participation.
- **Industries with near equal participation**: electronic and food processing
- **Industries with high female participation**: garment and health care.

BUSINESSES WELCOME OPPORTUNITIES FOR WORK-BASED LEARNING TO CLOSE THE SKILL MISMATCH

Employers are mixed in their perceptions of how well education and training institutions prepare workers. In response to a question whether educational institutions do a good job preparing the next generation workforce, nearly 60% of surveyed employers responded "in some areas education institutions do a good job, in other areas not so good." About a quarter of the respondents said that schools are not doing a good job at all, while about 15% said that schools are doing a good or excellent job.

Figure 8. "Do Education Institutions Do Well in Preparing Workforce?"



When analyzed by country, the majority of surveyed employers in Cambodia, Lao PDR, and Thailand felt that education institutions did well in some areas, and not so well in others. The highest level of dissatisfaction with education institutions was found in Myanmar and Vietnam with 66.7% and 58.3% of employers respectively reporting that they felt education institutions were not preparing young people well for employment.

An analysis by industry showed that over three quarters of employers in the health care sector and nearly two thirds of employers in the chemical industries were dissatisfied with the level of employment preparation education institutions provide to young people.

Employers from the survey emphasized that educational institutions should do a better job by providing internships/on-the-job training, and by providing better or more useful technical training for students. Employers also noted the importance that students should receive better computer/IT training, training in non-cognitive skills, such as communication, and language training, respectively.

Surveyed employers in Lao PDR, Myanmar, and Cambodia expressed considerable interest in developing closer ties to training institutions through on-the-job training or internship programs. Work-based learning programs are scarce in these countries. In contrast, many employers surveyed in Vietnam and Thailand either have formal MOUs with training institutions or other, more informal but structured training programs – typically accepting a certain number of interns per year for a standard amount of time. Among companies not implementing an internship program, the most commonly cited reason was a concern that interns would take too much staff time to properly train, and therefore that interns would act as a hindrance rather than to boost productivity.

> "[An] internship program is necessary and needed to improve the capability and professional/technical skills of young people. Companies should be involved by providing internship or on the job training opportunities to students so students can have more chances to practice and gain experiences.
>
> Also, the trained skills from companies will be more relevant to the market demand. This is a win-win option."
>
> *(Construction Employer - Lao PDR)*

Summary of Skill Gaps

Based upon the Assessment findings, USAID COMET will look to address regional skill gaps through three critical skill sets. These skill sets are

1) Foundational skills

2) STEM+AT Technical skills

3) Cross-Cutting skills

Together these form the basis from which USAID COMET will address mismatches, through providing information to businesses, educational institutions, and job-seekers on-the-job training, blended learning classroom content, and updated labor market information in addition to providing industry-specific referrals to curricula for foundational, technical, and soft skills training content.

Cross-cutting skills, including work-readiness ("soft" skills), entrepreneurial skills, and managerial skills, are in high demand throughout the LM sub-region, regardless of industry area. Nearly all recent skills surveys have demonstrated that for businesses, and especially those in export industries, or in high growth industries, the biggest drag on growth is in finding new hires and middle managers with these critical skills. Figure 9 depicts these three self-reinforcing sets of skills necessary to succeed in the workplace.

Figure 9. Skills needed to succeed in the workplace

To address the skill gap, USAID COMET's will focus on supporting educational institutions in revising their curricula. The updated training curricula will reflects business' needs and help equip jobseekers with the technical skills and experience required to gain and maintain employment in STEM+AT key growth sectors. USAID COMET will include the important non-cognitive skills as part of revised curricula. In

particular, the project will focus on those non-cognitive skills highlighted by employers: diligence, teamwork, adaptability, communication, time management for technical staff, as well as leadership, budgeting, or other in-demand skills for managerial staff.

3. Key Growth Sectors in STEM+AT

SUMMARY OF REGIONAL KEY GROWTH SECTORS AND THE SKILL GAPS

The key growth sectors shared among countries in the Lower Mekong are agriculture, construction, and tourism. These industries have absorbed a large number of labor force entrants in the Lower Mekong countries, but businesses in each industry are also facing challenges in finding new high-quality labor. Employers reported that graduates from technical schools and universities are not well prepared for the job market, with most students lacking not only non-cognitive and non-technical skills but also basic technical skills. Many employers in high demand industries must fill jobs regardless of the quality of new workforce entrance and therefore respond to skill mismatches by developing programs to train and coach newly recruited staff which in turn imposes higher costs for business operations when they hire university graduates and makes turnover more costly. Table 3 outlines key growth sectors and emergent growth sectors, based on the data from World Bank East Asia and Pacific Economic Update, April and October Issues (2013-2014):

Table 10. Key Growth Sectors, by Country

Country	Key growth sector	Emerging growth sector
Cambodia	• Garment • Construction • Agriculture • Tourism	• Electronics and vehicle parts
Lao PDR	• Natural resources sector (mining, hydropower, wood) • Construction • Tourism • Agriculture	• Garment • Telecommunications
Myanmar	• Natural resources (gas) • Construction • Tourism • Agriculture	• Energy • Garment • Telecommunications Food and beverages
Thailand	• Electronics (high value add) • Food processing and agro-products • Automotive Manufacturing • Metal and steel • Tourism	• Automotive: manufacturing factory floor and production line • Food processing: logistics systems

Country	Key growth sector	Emerging growth sector
Vietnam	• Electronics (high value add) and automotive parts • Garments, footwear, and furniture, • Agriculture (commodity exports) and aquaculture • Construction • Tourism	• Information and Technology • Biotechnology • Environmental protection • Marketing and business

The most common non-cognitive skills companies reported that they would like to see in new hires are: diligence, teamwork, adaptability at the workplace, communication, and time management. In terms of non-technical skills, many employers report that workers often have inadequate computer and English skills; two skills areas that many employers find difficult to address through job-specific training. While in-demand technical skills vary by country and industry—employers often find that technical staff do not possess the minimum technical skills to perform basic job functions. For example, in the auto industry, one surveyed company reported that its technicians and engineers do not understand how each part of an automobile operates. While these technical skills gaps are more easily addressed through job-specific training, many companies suggested that they would welcome tighter linkages between themselves and training institutions, especially through internship or on-the-job training programs.

SUMMARY OF KEY GROWTH SECTORS BY COUNTRY

Cambodia

Current Demand. The garment, tourism, construction and agriculture sectors—today's economic drivers—rely mostly low-skilled labor. However, Cambodia is facing a shortage of middle-skilled labor (technicians) and high-skilled labor (managers and engineers). In the next five years, the demand for labor is likely to shift towards semi-and high-skilled labor, with particularly high demand for technicians, middle-level and senior-level managers who specialize in civil engineering, electrical engineering, mechanical engineering, chemical and food engineering, information technology, and accounting. Industries anticipating demand for semi- and high- skilled labor are light manufacturing and assembly, rubber and plastics, construction, industry, tourism, food and beverage, and agro-industry.

Lao PDR

Current Demand. The pool of existing labor available is limited and mismatched for today's jobs. Most Laotian workers are low skilled, even in the specific technical skills demanded by growth industries. For example, garment manufacturers report a dearth of laborers skilled in sewing, designing and tailoring. Similarly, the construction sector reports that workers have limited skills in terms of brick laying, carpentry, machining, welding, and/or pipefitting. For hotel/tourism and for food processing skills shortages are attributed to a lack of non-technical and non-cognitive skills, such as language (especially English),

computer skills, and managerial skills. **In the next five years**, there is an industry-wide need to build and develop the skills of all workers in order to maintain competitiveness. All skilled labor is in a high demand, and most training institutions are incapable of filling the gap. In response, Laotian businesses must spend time training workers on job-specific skills after hiring, even when those skills could easily be learned as part of an in-school curriculum. In terms of survey responses, the highest demand and interest for internships or on-the-job training came from Laotian companies, clearly reflecting a true need on the part of employers to transition low-skilled workers into jobs that require better skill development than schools are able to provide.

Myanmar

Current demand. The majority of surveyed employers responded that education institutions are not preparing young people for employment. Indeed, most of the surveyed companies provide professional development or training for their employees. However, many of the employers reported that their current employees need additional training in skills directly relevant for their position. In addition, companies faced problems in terms of employees such as "lack of technical skills", "lack of time management skills", and "lack of leadership skills". The majority of the employers thought that re-training of their current employees would help with addressing some of the problems. Myanmar's key industries are hotel and tourism, telecom, fisheries, and manufacturing. Older sectors, such as agriculture and fisheries, are still the economic workhorses, and modernization of those industries ought to be at the forefront of development plans. Currently, there is much business speculation in Myanmar, with telecommunications and infrastructure companies particularly interested in investment.

Tourism is also a growth sector for Myanmar, which, interestingly, has been attracting particularly high-end toursists, although there have been indications that this sector is rapidly expanding to backpackers and other lower-end tourists[16]. Tourism currently accounts for only 1.6% of Myamar's GDP[17] but is growing rapidly, with tourist arrivals increasing by 27% between 2010 and 2011[18]. In terms of scale, however, Myanmar's total tourist industry in 2011 was approximately a quarter of the size of Lao PDR'[19]. Myanmar also links Bangladesh, China, India, and Thailand, linking approximately 40% of the world's population[20], and with potential to reclaim its historical role as a major trade route. There is development underway for deep-sea ports and improving road infrastructure.

Thailand

Current demand. According to survey data, three targeted industries (**automotive, food processing, and tourism**) expressed demand for workers who hold vocational certificates. While there was demand for university graduates, this was second to the demand for those with vocational qualifications. The lowest level of demand was for low-skilled and unskilled workers. In comparison to the food and tourism industries, the automotive industry expressed far greater demand for technicians, in particular for production line workers. In the food industry, the shortage staff with a Bachelor's degree is estimated to

be about 3-5% (down from 10%) of the available positions. In contrast, companies reported a shortage of 5-10% for Foreman, and an operator-level shortage of 20%. Representatives from the industry also noted lack of staff that are able to liaise between university graduates and lower-level staff, suggesting a lack of skills in leadership and effective communications among those with university degrees. In tourism, all workers are in demand. Hotel-based positions account for about 50% of all tourism-related job openings. Restaurants account for approximately 20% of positions, and spas and souvenirs account for the remaining 30% of positions.

In the next five years, the automotive industry will see rising demand for **technicians and mechanics** – in particular on the **manufacturing factory floor and production line**. Recent estimates suggest that 120,000 workers graduating from technical colleges will need to have their skills upgraded in order for Thailand to increase car production from 2.0 million to 3.5 million per year. The Thai food industry, which has a long value chain from the upstream to the downstream of production, has a growing demand for workers in the **food-processing** sub-industry and related **logistics systems**. The industry needs technicians to fill positions including those with **mechanical knowledge** (machine parts and functions), **standard control technicians, and quality control staff** to inspect food products so as to meet international standards for quality control. Food factories train their staff about core and general standards, and what are included in them. Regarding tourism, popular destinations such as Chiang Mai, Phuket and Krabi forecast growing demand and the need to hire new workers, with up to 100,000 new workers anticipated after the 2015 launch of the AEC.

Vietnam

Current demand. It is estimated that skilled training for the textile and garment industry meets approximately 20% of the actual demand. For example, each year there are about 150 graduates from technical universities working as **engineers** on textile and garment related professions such as **spinning, knitting, dyeing, garment technology, fashion design**, etc. This number cannot meet the demand of more than 6,500 textile and garment companies across the country. There is also high demand and a related mismatch for nurses: public and private hospitals lack skilled nurses. The demand is for nurses with college and university education (i.e., three and four years of training) rather than vocational training where two years of training is typical. However, about 80% of current nurses only have vocational secondary training.

Industry growth and demand in Vietnam is regional. For example, the dominant industries in the Northern Vietnam are **agricultural and forest products, electronics, tourism; finance, banking, tourism, hotel management, transportation, health care, electrics, and food processing.** In Central Vietnam, current key industries include **chemical/petrol, electrics, aquaculture, tourism, finance and banking.** Along the Mekong Delta, key growth industries are **food processing, aquaculture, and vegetable products**. Over **the next five years**, growing industries will likely include **information**

technology, tourism, biotechnology, environment protection, marketing and business administration. For selected industries, there is forecasted demand for specific occupations such as **nurses for the elderly**, stemming from a demographic shift towards an aging population. In the textile and garment industries, demand is already shifting in anticipation of Vietnam becoming a signatory to the Trans-Pacific Strategic Economic Partnership Agreement (TPP) due to the TPP's strict requirements on origin of products from ASEAN countries; in response, occupations such as spinning, knitting and dyeing are growing fast to meet the demand.

4. Mixed Access to Telecommunication and Internet

Access to mobile phone and Internet varies across the Lower Mekong Countries. In Thailand and Vietnam, the access to mobile phone and Internet is high in comparison to Cambodia, Lao PDR and Myanmar. However, almost all students who participated in focus group discussions reported having access to Internet at home and school via their mobile phone devices.

Access to telecommunications is more than about linking people to information. **Across the board, businesses reported that they expect their employees to incorporate ICT into everyday workflow**. From hotel bookings to handing sophisticated diagnostics computers on automotive assembly lines, ICT is increasingly an integral part of the workplace. Students often are interested in online learning, both in school and on their own. As such, USAID COMET plans to rely heavily upon information technology to bring online content and information to the workforce, though an online portal. In this manner, USAID COMET will work through schools but also directly reach students with online training content, labor market information, and links to employers.

However, as the Assessment has documented, many educational institutions reported some, but not extensive, access to telecommunications by teachers or by students. Teachers in Lao PDR, Cambodia, and Myanmar report access to computers, but low-bandwidth makes it difficult to incorporate online content into training. In Thailand and Vietnam, educational institutions more frequently offer high-bandwidth Internet connections and WIFI.

To address this partial and differential access to connectivity across the LM sub-region, USAID COMET will design its web portal so as to use low bandwidth technologies to maximize user accessibility (though a threshold level of connectivity may be necessary for users to benefit from these online resources). Additionally, USAID COMET will seek innovative solutions such as the use of mobile technologies or special partnerships with technology providers to address connectivity issues.

Conclusion: Implications for USAID COMET

The purpose of the Baseline Assessment is to identify and address skill gaps in the key and growing STEM+AT industries across the LM sub-region, and as such to help the USAID COMET project to design and implement interventions that are mindful of these trends. The Baseline Assessment also seeks to identify critical stakeholders who prepare students in STEM+AT fields, addressing the skills of these teachers and aligning current curricula with business demands, in order to improve the capacity and state of STEM+AT on both the supply and demand side of the equation.

To summarize, the key findings of the Baseline Assessment are:

- Dynamic and rapid integration of the LM countries, requiring job seekers to have a mix of foundational, technical and work readiness skills
- Employers are hiring across the region, but they want employees with foundational technical, and work readiness skills
- STEM+AT skill mismatches presents challenges and also opportunities
- Mixed female participation in the labor force
- Marked lack of practical and applied skills and experience, but high demand from businesses for on-the-job training or internship programs.
- The regional key growth sectors that will be the focus of USAID COMET in Year 1 include:
    - Agriculture/Aquaculture, Agro-processing, Food and Beverage Processing;
    - Automotive Parts Manufacturing/Vehicle Assembly;
    - Construction;
    - Electronics (low and high value add); and
    - Tourism

Results from the baseline indicated that most recent graduates lack the basic technical skills required for the workplace. Employers emphasized that graduates hired out of school often do not have the necessary knowledge required for their technical or managerial positions. Those who do have the requisite technical skills often lack practical skills and experience, and are therefore unable to perform satisfactorily. Employers also asserted that schools focus too much on teaching theory than trying to provide practical experience for students.

To address and cope with these issues, one of USAID COMET's tasks is to focus on its support for educational institutions in curriculum development. The project aims to provide updated training curricula to partner educational institutions that reflect private sector needs and equip job seekers with the skills and experience required to gain and maintain employment in STEM+AT key growth sectors. In addition, USAID COMET will reinforce the important non-cognitive skills as critical skills in the in the 21st century

workplace. In particular, the project will focus on those non-cognitive skills highlighted by employers: diligence, teamwork, adaptability, communication, and time management.

Findings from the baseline revealed computer/ICT skills and practical English language skills as additional qualifications that employers look for from job applicants. For technical positions, English language skills were mostly considered necessary in the electronic, tourism, and automotive industries; for managerial positions, three out of four surveyed employers noted that they are more likely to hire a candidate who has strong computer and English language skills. USAID COMET will be addressing these by promoting English language skills through curriculum development for educational institutions, as well as through the portal.

More than half of the employers surveyed said that "In some areas, education institutions do a good job, in other areas not so good". One of USAID COMET's project components, "Training Today's Workforce", will focus on providing vocational training that fills the skill gaps. USAID COMET will aim to provide a continuum of training content for each STEM+AT technical skill area, as indicated from the Baseline. Moreover, USAID COMET will aim to bring businesses and educational institutions closer together through establishing opportunities for work-based learning, internships, or forms of on-the-job training that put employers at the core of educational interventions.

To respond to these challenges, USAID COMET intends—as a regional project— to undertake the following activities to address the skill gap: (i) improve STEM+AT curricula and delivery methods; (ii) provide training for the trainers/teachers/educators; (iii) actively encourage businesses to partner in curriculum development; (iv) promote the establishment of effective internship and apprenticeship programs with training institutions; (v) train participants on computer skills while remaining mindful of real limits on access to technology; and (vi) encourage employers to hire qualified female employees and boost interventions targeting female participants in STEM+AT. These interventions are summarized in the table below.

Table 1. Summary of Skill Gaps and Recommended Activities

Key Challenges	USAID COMET Activities
Non-technical skills (ICT and English)	• Improve STEM+AT curricula and delivery methods • Provide training for the trainers/teachers/educators • Actively encourage businesses to partner in curriculum development
Non-cognitive skills (diligence, teamwork, adaptability, communication, and time management)	
Technical skills (in agriculture, construction and tourism)	
Lack of practical, applied skills	• Work with educational institutions and businesses to facilitate internships or work-based learning programs

Key Challenges	USAID COMET Activities
Differential access to telecommunications and ICTs	• Integrate computer/ICT skills as part of work • Be mindful of activities that involve low bandwidth technologies and applications • Use mobile technology when and where appropriate
Mixed female participation in the labor force	• Encourage employers to hire qualified female employees • Boost the participation of female participants and gear the training programs to their needs

USAID COMET expects to conduct iterative assessments related to jobs and skill trends across the LM region for the next several years. The project will be attuned to the changes that occur in these trends, both at a macro-level and what the project itself is able to help improve. The result, it is hoped, is a profound improvement in the lives of youth across the Lower Mekong and a valuable contribution to prosperity and peace for the long-term.

Endnotes

[1] MRC 2003
[2] MRC 2003, p.59
[3] CIA World Factbook, at PPP
[4] Ibid.
[5] Ibid.
[6] Ibid.
[7] The AEC has already reduced non-tariff barriers to trade across the region
[8] IFAD (2014)
[9] Jampaklay and Kittisuksathit, 2009 as cited in Southichak 2013.
[10] EDC (2012)
[11] McKinsey Global Institute (2012). Sustaining Vietnam's Growth: The Productivity Challenge.
[12] Bruni et al 2013, p. 42
[13] Bruni Et Al (2013)
[14] Cambodia's 2014 diagnostic trade integration strategy paper p.13
[15] The Education First language survey ranks Thai English skills at 48 out of 63 countries surveyed in 2014; see http://www.ef.co.th/epi/
[16] McKinsey (2013)
[17] Irrawaddy (2014). Industry Experts See Potential Backpacker Boom.
[18] World Travel and Tourism Council (2014d)
[19] Ibid.
[20] McKinsey (2013)
[21] McKinsey (2013), p.22

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